CLAIMS

1. Apparatus for use in monitoring particles in a fluid flow, comprising:

   a duct for receiving the fluid flow;

   light generating means adjacent the duct for transmitting light into the fluid flow via a first at least partially light-transmissive part of the duct;

   light-responsive detection means adjacent a second at least partially light-transmissive part of the duct for receiving light from the light generating means which has passed through the fluid flow;

   processing means for location remotely from said duct; and

   means for coupling the processing means with the detection means, the processing means being adapted for processing signals therefrom to provide data relating to particles in the fluid flow.

2. Apparatus according to claim 1, wherein said duct comprises a pipe section provided with means for mounting it in a run of pipework.

3. Apparatus according to claim 1, wherein said first and second at least partially light-transmissive parts comprise first and second windows in a wall of the duct.

4. Apparatus according to claim 1, wherein said first and second at least partially light-transmissive parts are diametrically opposite each other.

5. Apparatus according to claim 1, wherein inside said duct, each of said first and second at least partially light-transmissive parts has a non-stick coating.

6. Apparatus according to claim 1, wherein said duct is provided with means for flushing away deposits from each of said first and second at least partially light-transmissive parts inside the duct.

7. Apparatus according to claim 6, wherein said flushing means is located downstream of said first and second at least partially light-transmissive parts.

8. Apparatus according to claim 6, wherein said flushing means comprises, for each of said first and second at least partially light-transmissive parts, a respective nozzle for directing a flushing fluid at the respective part from inside the duct.

9. Apparatus according to claim 1, wherein said light generating means comprises a light-emissive diode.

10. Apparatus according to claim 9, wherein said light generating means comprises a plurality of such diodes.

11. Apparatus according to claim 10, wherein said diodes are connected in parallel.

12. Apparatus according to claim 1, wherein said light-responsive detection means comprises a television camera.

13. Apparatus according to claim 12, wherein said camera is provided with a lens and frame grabbing means for capturing one magnified single image at a time, focussed inside said duct, the signals received by said processing means representing successive captured images from said grabbing means.

14. Apparatus according to claim 1, which is such that said processing means provides data relating to the amount and/or size distribution of particles of a predetermined kind in the fluid flow.

15. Apparatus according to claim 1, wherein the surface of said first at least partially light-transmissive part inside said duct is uneven for reducing deposit build-up on it.

16. Apparatus according to claim 1, including a plurality of such light-responsive detection means.

17. Apparatus according to claim 16, which is such that only one of said light-responsive detection means is used at a time.

18. Apparatus according to claim 16, wherein each of said light-responsive detection means receives light from said second at least partially light-transmissive part.

19. Apparatus according to claim 1, wherein there is a plurality of such first at least partially light-transmissive parts.

20. Apparatus according to claim 19, wherein there is a plurality of such second at least partially light-transmissive parts, each of which is associated with a respective one of said first at least partially light-transmissive parts.

21. Apparatus according to claim 20 including a plurality of such light-responsive detection means, wherein each of said light-responsive detection means receives light from a respective one of said second at least partially light-transmissive parts.

22. Apparatus according to claim 19, wherein said duct is provided with means for flushing away deposits from each of said first and second at least partially light-transmissive parts inside the duct and wherein each of said first and second at least partially light-transmissive parts is associated with respective such flushing means.

23. Apparatus according to claim 1, wherein there is a plurality of such light generating means.

24. Apparatus according to claim 23, which is such that only one of said light generating means is used at a time.

25. Apparatus according to claim 23, wherein there is a plurality of such first at least partially light-transmissive parts and wherein each of said light generating means is associated with a respective one of said first at least partially light-transmissive parts.

26. Apparatus according to claim 1, with said duct mounted in pipework for conveying the fluid flow, the processing means being located at a location remote therefrom and the coupling means coupling the processing means and the light-responsive detection means.

27. Apparatus according to claim 26, wherein said pipework is for conveying water into a well in a hydrocarbon production system.

28. Apparatus according to claim 27, wherein said duct, the or each first and second light-transmissive parts, the or each light generating means and the or each light-responsive means are sub-sea.

29. Apparatus according to claim 28, wherein said remote location is a topside platform.

30. A method of monitoring particles in a fluid flow, using apparatus according to claim 1.